



HT32F1755/HT32F1765/HT32F2755 Development Board User Manual

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1 Introduction

The HT32F1755/1765/2755 development board is designed for the HT32F1755/1765/2755 series of microcontrollers. The HT32F1755/1765/2755 series of microcontrollers contain a variety of peripherals such as high speed SAR ADC, OPAMP, USB, I²C, USART, SPI, GPTM, MCTM, CSIF (HT32F2755), SCI, WDT, RTC, SWJ-DP (Serial Wire/JTAG Debug Port) etc.

The development board includes some specific components to help evaluate all the device peripherals, such as an RS232 transceiver, EEPROM, series NOR flash, smart card Interface chip, potentiometer etc.

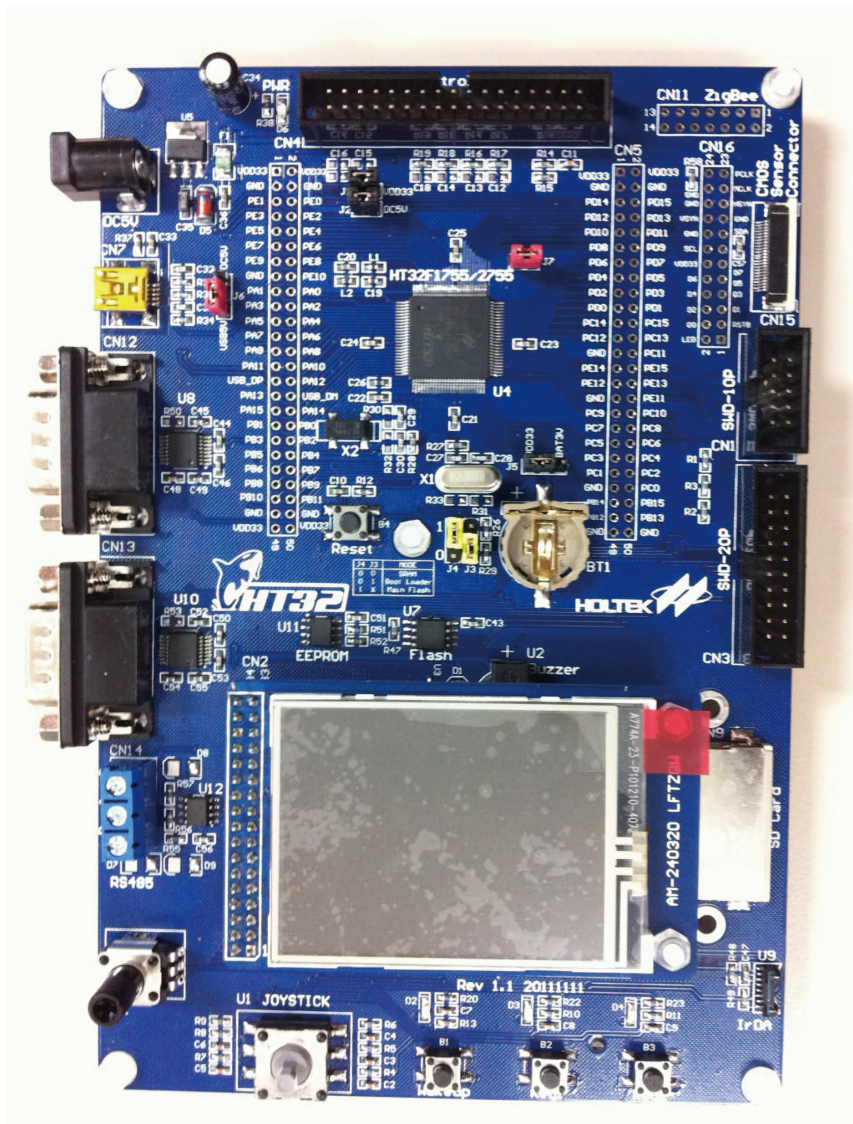


Figure 1. HT32F1755/1765/2755 Development Board

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Features

- USB2.0 full speed connection
- 5V power supply: mini USB connector or 5V power jack
- Two RS232 connectors - CN13 support for RTS/CTS flow control
- IrDA transceiver
- RS485 transceiver
- Reset, wakeup and two key buttons
- Three LEDs
- CMOS sensor connector - HT32F2755 only
- Joystick with four direction control and selector
- I²C-compatible serial interface EEPROM
- SPI-compatible serial interface Flash
- SPI and I²C extension interfaces for LCD display application
- Motor control connector for motor control applications
- SD card slot - SPI mode
- Smart card slot
- PWM output for buzzer driving
- Backup battery
- Boot from Flash, SRAM or boot loader
- SWD-10P, SWD/JTAG-20P debug port interface.

2 Hardware Layout

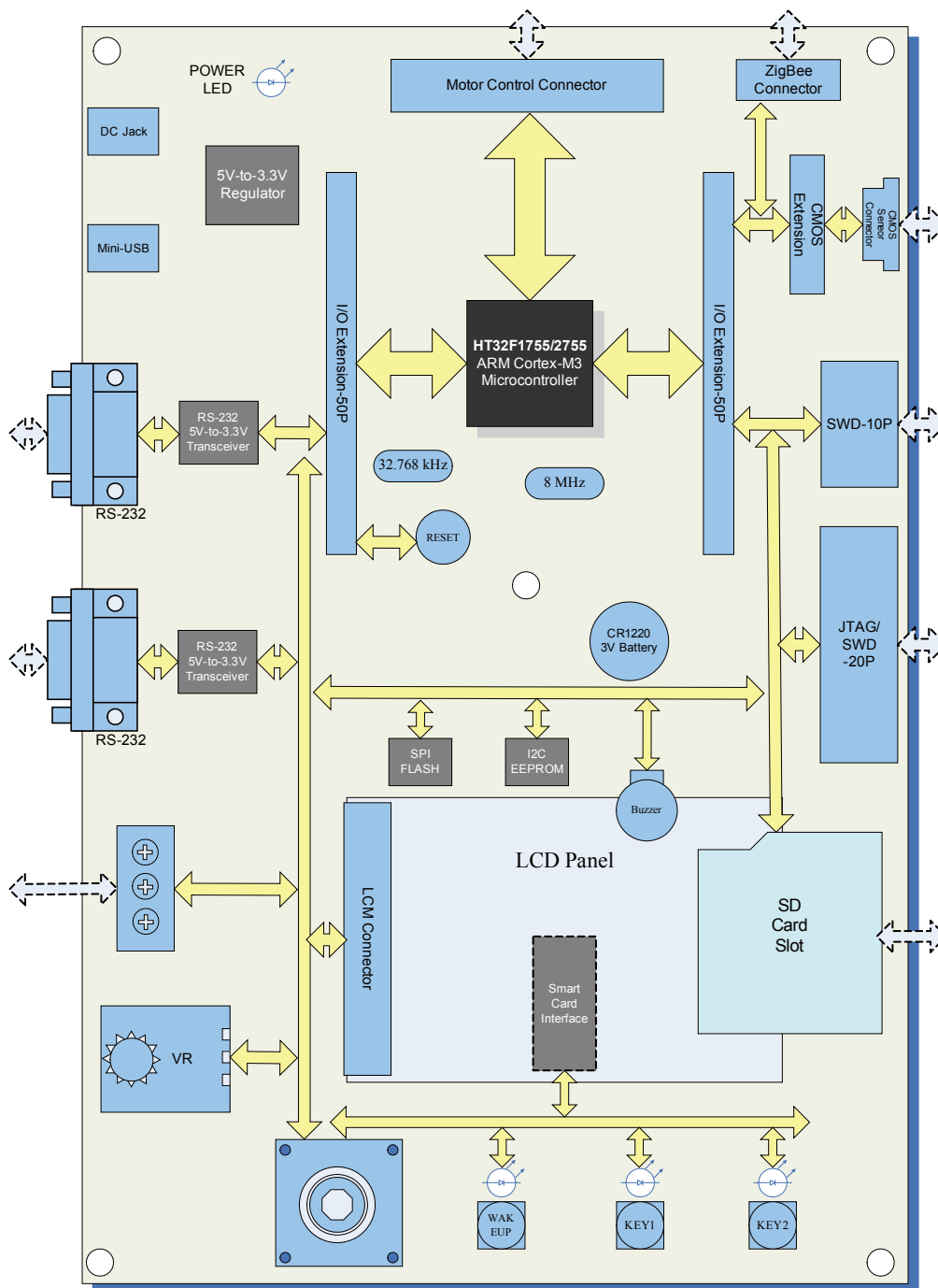


Figure 2. HT32F1755/1765/2755 Development Board Block Diagram

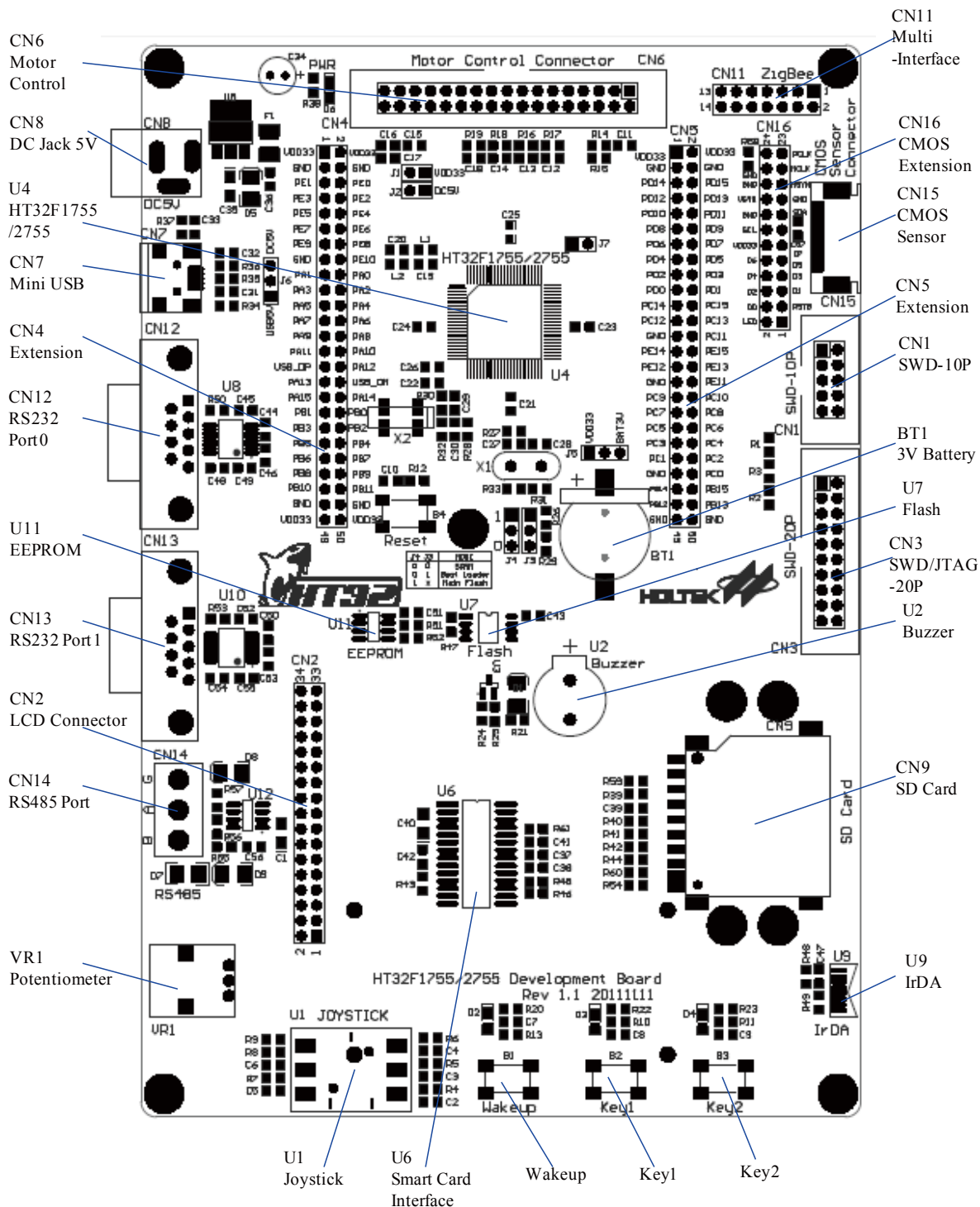
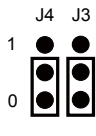
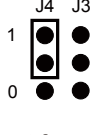


Figure 3. HT32F1755/1765/2755 Development Board Layout

Boot Option

Table 1. Boot Jumpers

Jumper	Description
J3 & J4	Boot loader mode  Boot from the embedded boot loader.
	SRAM mode  Boot from the embedded SRAM
	Main flash mode  Boot from the embedded main flash. BOOT0 (J3) don't care and BOOT1 (J4) = 1 (default setting)

V_{BAT} Option

Table 2. V_{BAT} Jumpers

Jumper	Description
J3	V _{BAT} pin is connected to the 3.3V power - default setting 
	V _{BAT} pin is connected to the 3V CR1220 battery 

Power Supply Option

Table 3. Power Supply Jumpers

Jumper	Description
J6	For power supply from Mini USB port (CN7) 
	For power supply from power supply jack (CN8) 

SWD-10P Connector CN1

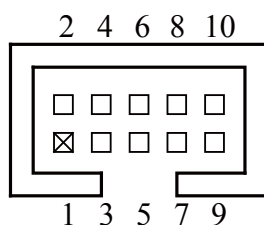


Figure 4. SWD-10P Connector CN1

Table 4. SWD-10P Connector CN1

Pin#	Description	Pin#	Description
1	3.3V	2	SWDIO (PE13)
3	GND	4	SWCLK (PE12)
5	GND	6	TRACESWO (PE11)
7	NC	8	NC
9	GND	10	Reset#

LCD Connector CN2

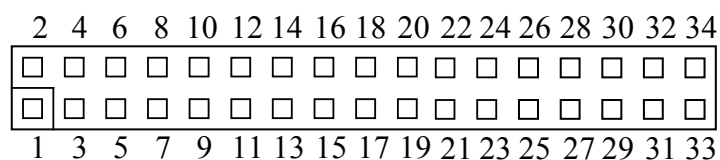


Figure 5. LCD Connector CN2

Table 5. LCD Connector CN2

Pin#	Description	Pin#	Description
1	5V	2	GND
3	LCD_BL(PA13)	4	I2C1_SDA(PC7)
5	I2C1_SCL(PC6)	6	SPI0_SCK(PD1)
7	SPI0_MISO(PD3)	8	SPI0_MOSI(PD2)
9	SPI0_CS(PD0)	10	TP_INT(PD7)
11	GND	12	LCD_RESET(PD6)
13	NC	14	3.3V
15	NC	16	NC
17	NC	18	NC
19	NC	20	NC
21	NC	22	NC
23	NC	24	NC
25	NC	26	NC
27	NC	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC

SWD/JTAG-20P connector CN3

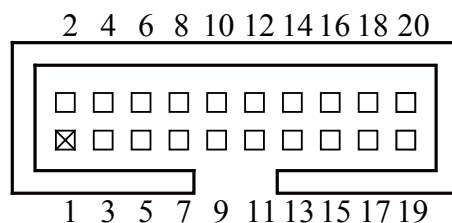


Figure 6. SWD/JTAG-20P connector CN3

Table 6. SWD/JTAG-20P connector CN3

Pin#	Description	Pin#	Description
1	3.3V	2	3.3V
3	JTREST(PE15)	4	GND
5	JTDI(PE14)	6	GND
7	JTMS/SWDIO(PE13)	8	GND
9	JTCK/SWCLK(PE12)	10	GND
11	NC	12	GND
13	JTDO/TRACESWO(PE11)	14	GND
15	RESET#	16	GND
17	NC	18	GND
19	NC	20	GND

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Extension Connectors CN4 & CN5

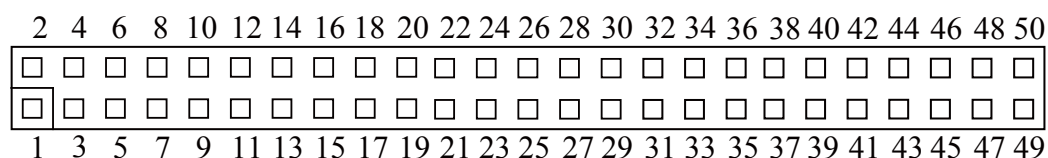


Figure 7. Extension Connectors CN4 & CN5

Table 7. Extension Connector CN4

Pin#	Description	Pin#	Description
1	3.3V	2	3.3V
3	GND	4	GND
5	PE1	6	PE0
7	PE3	8	PE2
9	PE5	10	PE4
11	PE7	12	PE6
13	PE9	14	PE8
15	NC	16	PE10
17	PA1	18	PA0
19	PA3	20	PA2
21	PA5	22	PA4
23	PA7	24	PA6
25	PA9	26	PA8
27	PA11	28	PA10
29	USB_DP	30	PA12
31	PA13	32	USB_DM
33	PA15	34	PA14
35	PB1	36	PB0
37	PB3	38	PB2
39	PB5	40	PB4
41	PB6	42	PB7
43	PB8	44	PB9
45	PB10	46	PB11
47	GND	48	GND
49	3.3V	50	3.3V

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Table 8. Extension Connector CN5

Pin#	Description	Pin#	Description
1	3.3V	2	3.3V
3	GND	4	GND
5	PD14	6	PD15
7	PD12	8	PD13
9	PD10	10	PD11
11	PD8	12	PD9
13	PD6	14	PD7
15	PD4	16	PD5
17	PD2	18	PD3
19	PD0	20	PD1
21	PC14	22	PC15
23	PC12	24	PC13
25	NC	26	PC11
27	PE14	28	PE15
29	PE12	30	PE13
31	NC	32	PC11
33	PC9	34	PC10
35	PC7	36	PC8
37	PC5	38	PC6
39	PC3	40	PC4
41	PC1	42	PC2
43	NC	44	PC0
45	PB14	46	PB15
47	PB12	48	PB13
49	GND	50	GND

Motor Control Connector CN6

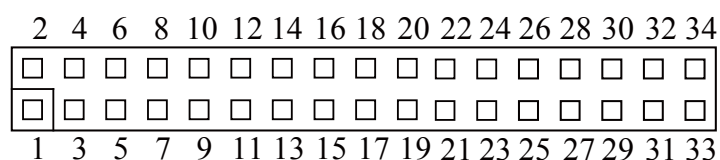


Figure 8. Motor Control Connector CN6

Table 9. Motor Control Connector CN6

Pin#	Description	Pin#	Description
1	Fault(PE3)	2	GND
3	PWM_1H(PD12)	4	GND
5	PWM_1L(PD13)	6	GND
7	PWM_2H(PD14)	8	GND
9	PWM_2L(PD15)	10	GND
11	PWM_3H(PE0)	12	GND
13	PWM_3L(PE1)	14	HV Bus(PA0)
15	Current PA(PA2)	16	PFC_ADC1(PA5)
17	Current PB(PA3)	18	NC
19	Current PC(PA7)	20	NC
21	NC	22	PFC_PWM1(PA12)
23	NC	24	PFC_PWM2(PA13)
25	5V	26	Heat Sink Temp(PA1)
27	NC	28	3.3V
29	NC	30	GND
31	Measure PA(PE5)	32	GND
33	Measure PB(PE6)	34	Measure PC(PE7)

Mini USB Type B Connector CN7

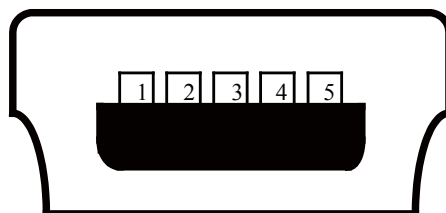


Figure 9. Mini USB type B Connector CN7

Table 10. Mini USB type B Connector CN7

Pin#	Description	Pin#	Description
1	USB_5V	2	D-
3	D+	4	NC
5	GND		

Power Supply Connector CN8

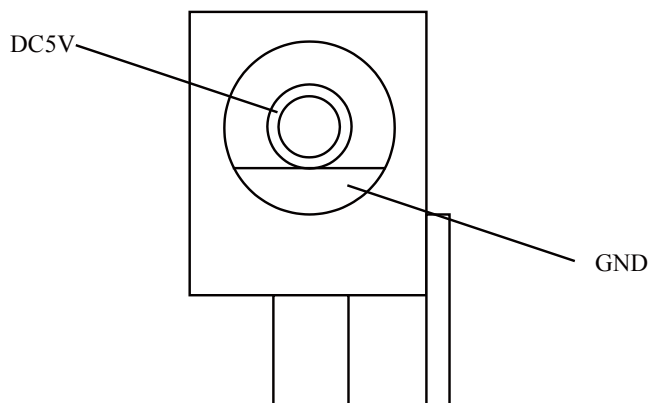


Figure 10. Power Supply Connector CN8

SD card Connector CN9

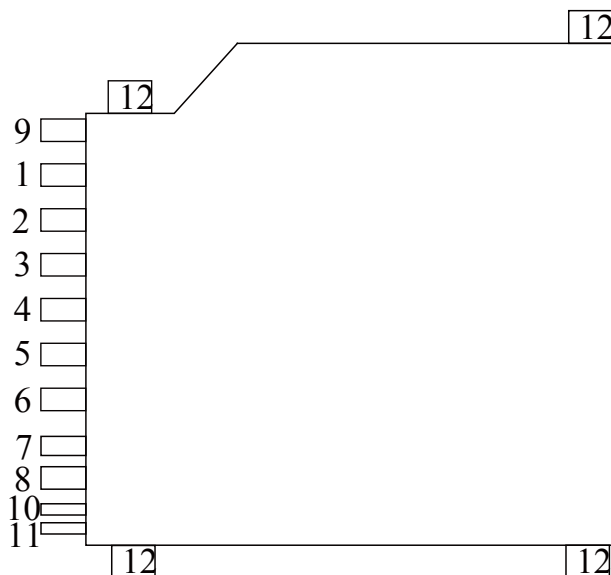


Figure 11. SD card Connector CN9

Table 11. SD card Connector CN9

Pin#	Description	Pin#	Description
1	SD_CARD_CS(PA8)	2	SPI1_MOSI(PC2)
3	GND	4	3.3V
5	SPI1_SCK(PC1)	6	GND
7	SPI1_MISO(PC3)	8	NC
9	NC	10	SD_CARD_CD(PA9)
11	SD_CARD_WP(PA11)	12	GND

Multi-interface Connector CN11

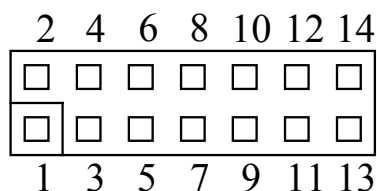


Figure 12. Multi-interface Connector CN11

Table 12. Multi-interface Connector CN11

Pin#	Description	Pin#	Description
1	3.3V	2	GND
3	I2C0_SDA(PC11)	4	NC
5	I2C0_SCL(PC12)	6	SPI1_SEL(PD4)
7	SPI1_MOSI(PC2)	8	SPI1_MISO(PC3)
9	SPI1_SCLK(PC1)	10	NC
11	NC	12	PD5
13	NC	14	NC

RS232 Port0 Connector CN12

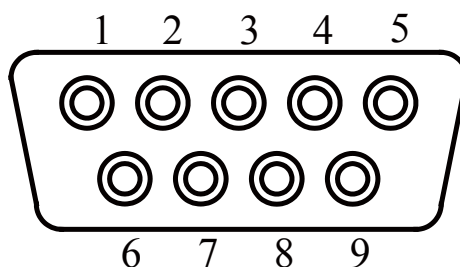


Figure 13. RS232 Port0 Connector CN12

Table 13. RS232 Port0 Connector CN12

Pin#	Description	Pin#	Description
1	Connect to PIN4	2	USART0_Rx (PC10)
3	USART0_Tx (PC8)	4	Connect to PIN6
5	GND	6	Connect to PIN1
7	Connect to PIN8	8	Connect to PIN7
9	NC		

RS232 Port1 Connector CN13

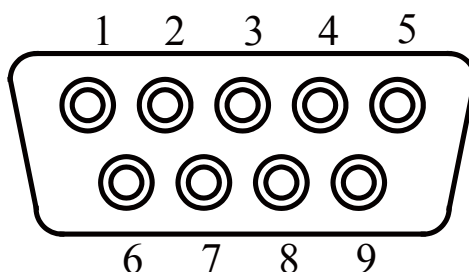


Figure 14. RS232 Port1 Connector CN13

Table 14. RS232 Port1 Connector CN13

Pin#	Description	Pin#	Description
1	Connect to PIN4	2	USART0_Rx (PC5)
3	USART0_Tx (PC4)	4	Connect to PIN6
5	GND	6	Connect to PIN1
7	USART1_RTS(PB15)	8	USART1_CTS(PB14)
9	NC		

RS485 Port Connector CN14

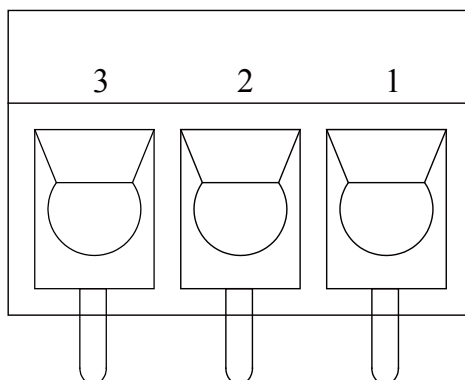


Figure 15. RS485 Port Connector CN14

Table 15. RS485 Port Connector CN14

Pin#	Description	Pin#	Description
1	B	2	A
3	GND		

CMOS Sensor Connector CN15

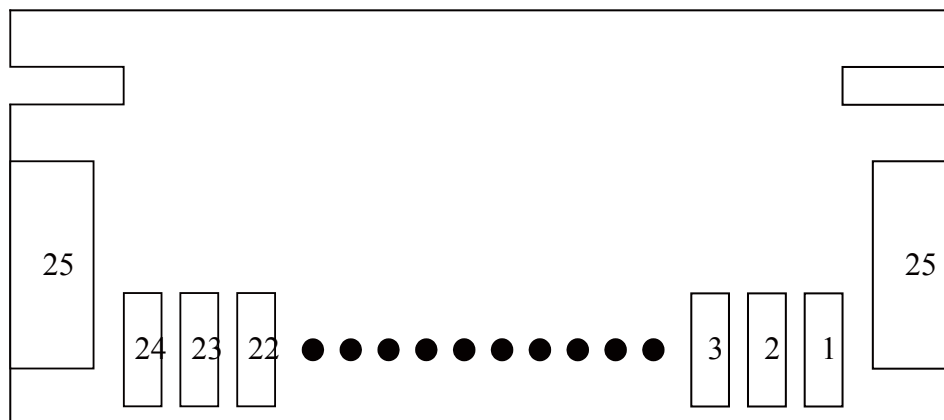


Figure 16. CMOS Sensor Connector CN15

Table 16. CMOS Sensor Connector CN15

Pin#	Description	Pin#	Description
1	NC	2	CMOS_LED(PD12)
3	Reset(PD13)	4	CSIF_D0(PD8)
5	CSIF_D1(PD9)	6	CSIF_D2(PD10)
7	CSIF_D3(PD11)	8	CSIF_D4(PE5)
9	CSIF_D5(PE6)	10	CSIF_D6(PE7)
11	CSIF_D7(PE8)	12	3.3V
13	3.3V	14	I2C1_SCL(PC6)
15	I2C1_SDA(PC7)	16	GND
17	GND	18	CSIF_VSYNC(PE15)
19	CSIF_HSYNC(PE14)	20	GND
21	CSIF_MCLK(PC12)	22	GND
23	CSIF_PCLK(PC11)	24	CMOS_PD(PD14)
25	GND		

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CMOS Sensor Extension Connector CN16

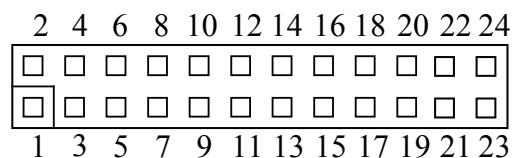


Figure 17. CMOS Sensor Extension Connector CN16

Table 17. CMOS Sensor Extension Connector CN16

Pin#	Description	Pin#	Description
1	NC	2	CMOS_LED(PD12)
3	Reset(PD13)	4	CSIF_D0(PD8)
5	CSIF_D1(PD9)	6	CSIF_D2(PD10)
7	CSIF_D3(PD11)	8	CSIF_D4(PE5)
9	CSIF_D5(PE6)	10	CSIF_D6(PE7)
11	CSIF_D7(PE8)	12	3.3V
13	3.3V	14	I2C1_SCL(PC6)
15	I2C1_SDA(PC7)	16	GND
17	GND	18	CSIF_VSYNC(PE15)
19	CSIF_HSYNC(PE14)	20	GND
21	CSIF_MCLK(PC12)	22	GND
23	CSIF_MCLK(PC11)	24	CMOS_PD(PC14)

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3 Schematics

This section shows the complete circuit of the HT32F1755/1765/2755 development board:

- Figure 18 includes the MCU and boot pins.
- Figure 19 includes the SD card, Smart Card, Flash and Multi-interface.
- Figure 20 includes the USB and CMOS sensor.
- Figure 21 includes the Joystick, Buttons and Potentiometer.
- Figure 22 includes the Motor Control, LEDs and buzzer.
- Figure 23 includes the RS232, RS485, IrDA and EEPROM.
- Figure 24 includes the LCD, Extension Connectors and SWD/JTAG Connector.

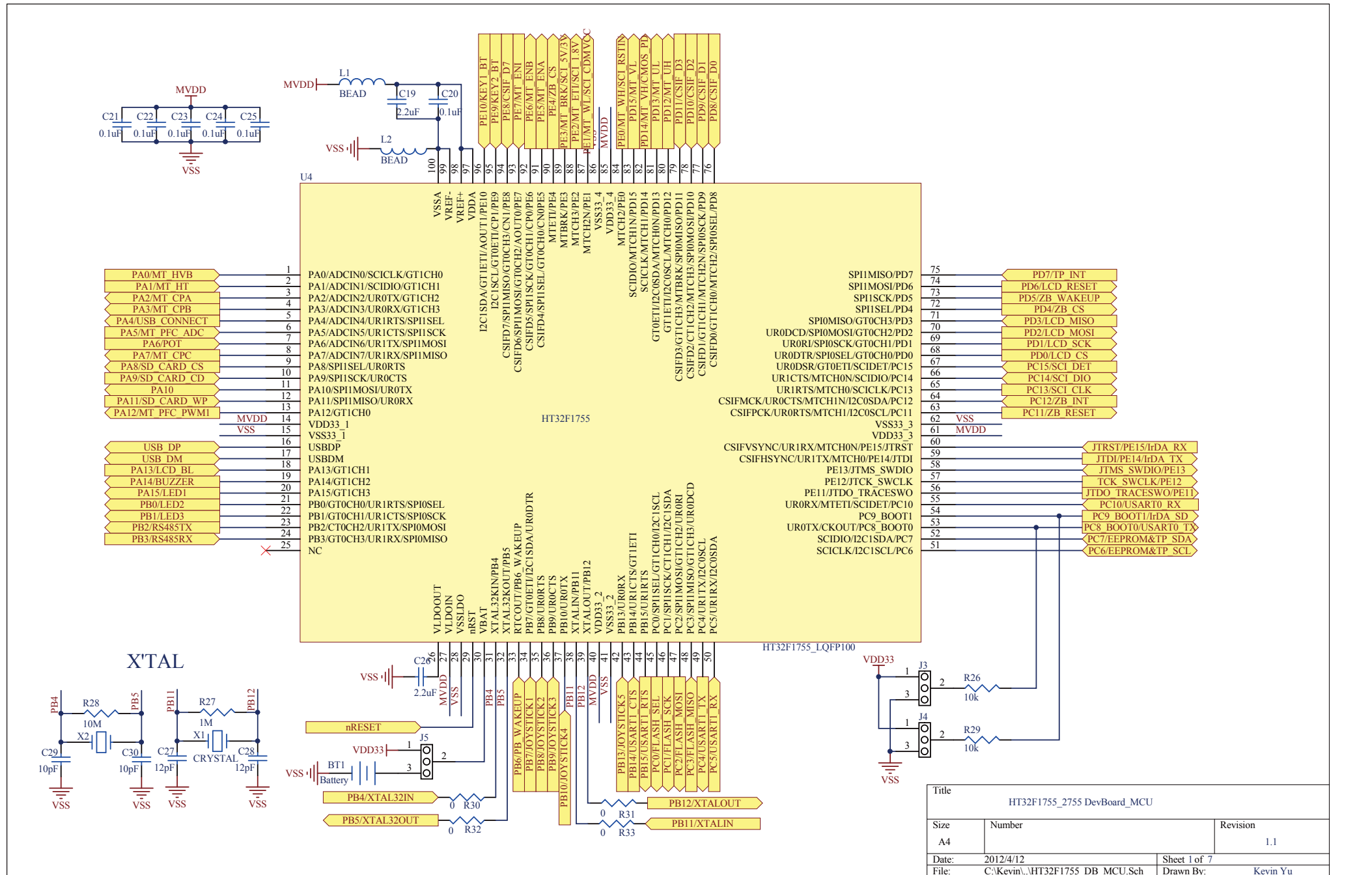
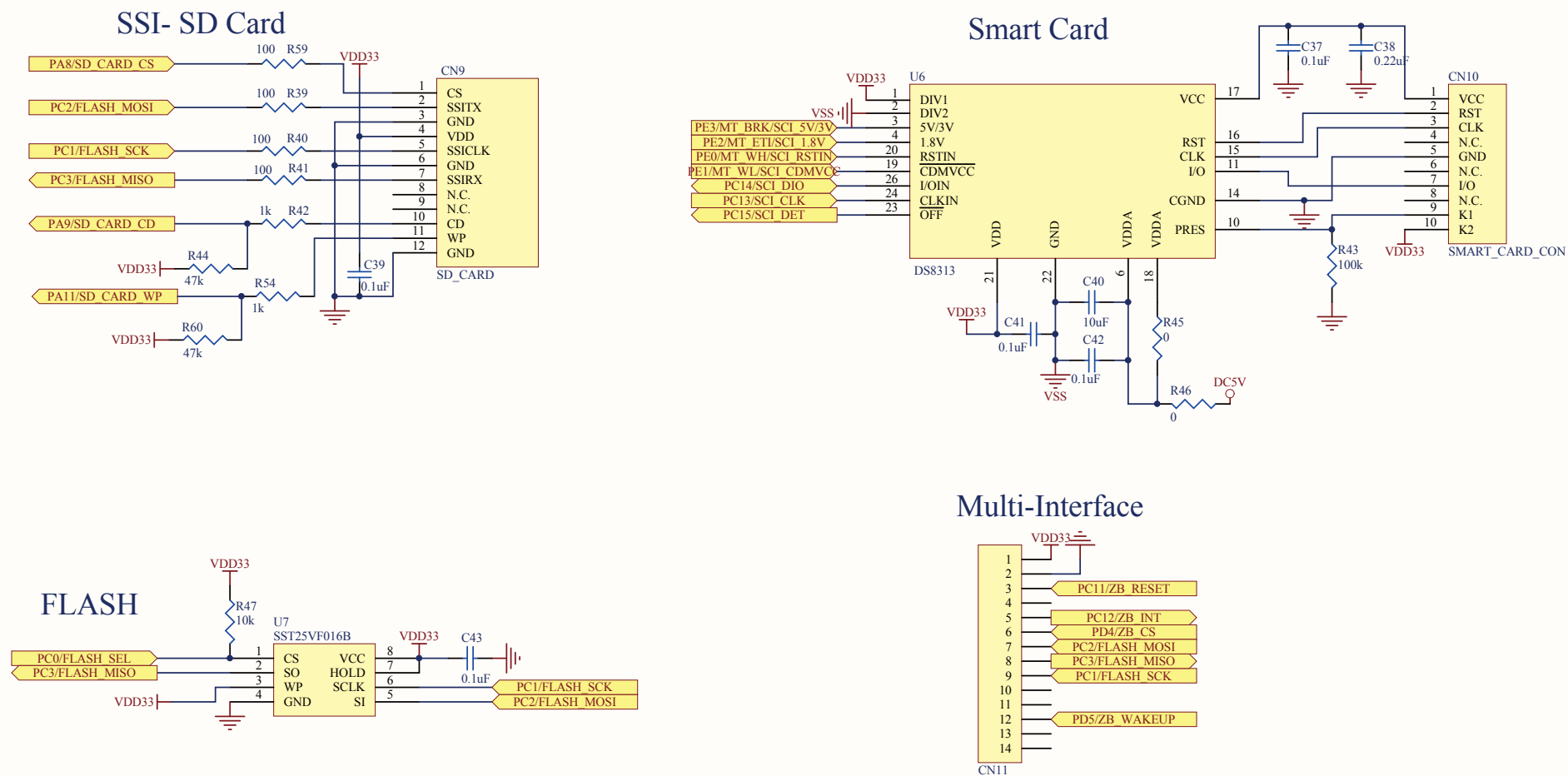
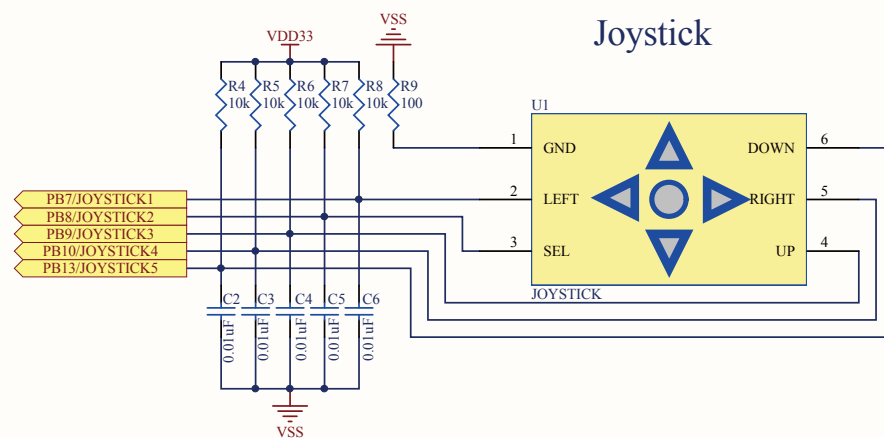


Figure 18. MCU and Boot Pins

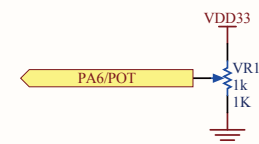


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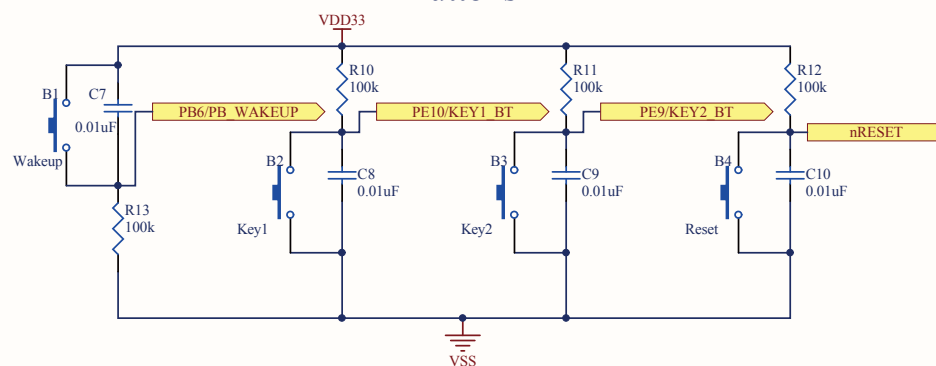
Figure 19. SD Card, Smart Card, Flash and Multi-interface



Potentiometer

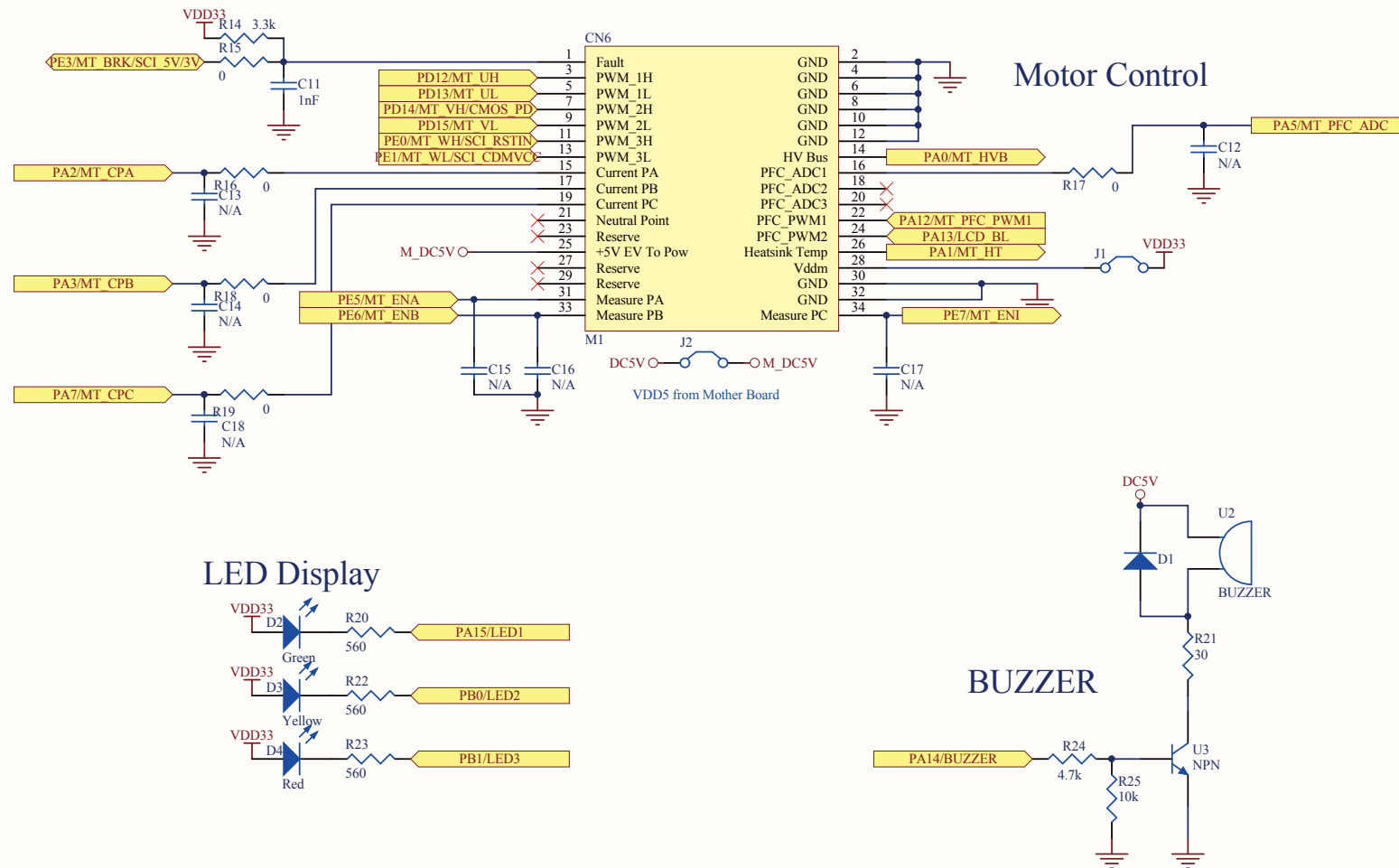


Buttons



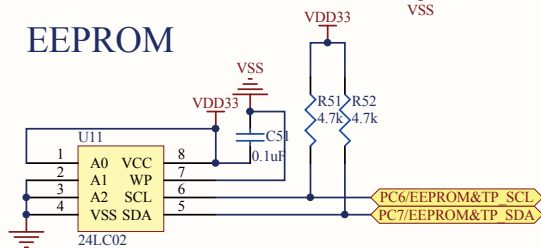
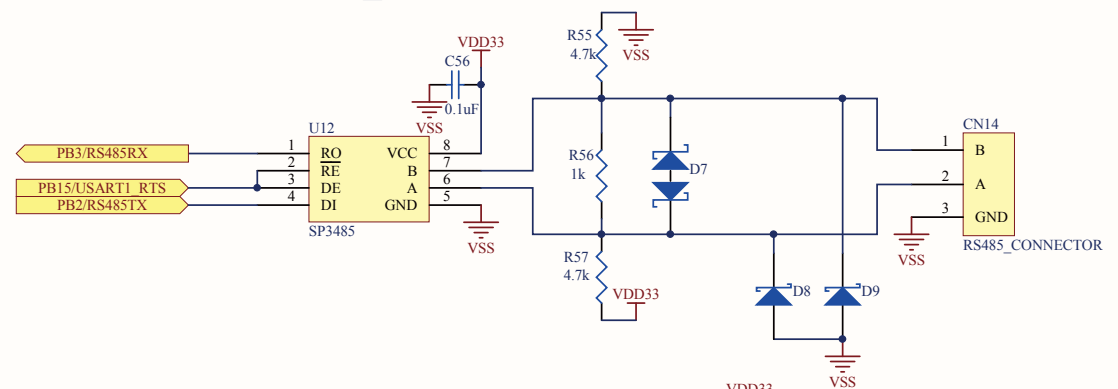
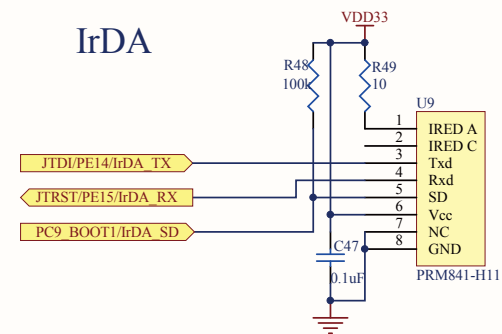
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Figure 21. Joystick, Buttons and Potentiometer



Title		
HT32F1755_2755 DevBoard_GPTM&MCTM		
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Figure 22. Motor Control, LEDs and Buzzer



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File:	C:\Kevin\USART&I2C SchDoc			Drawn By: Kevin Yu	

Figure 23. RS232, RS485, IrDA and EEPROM

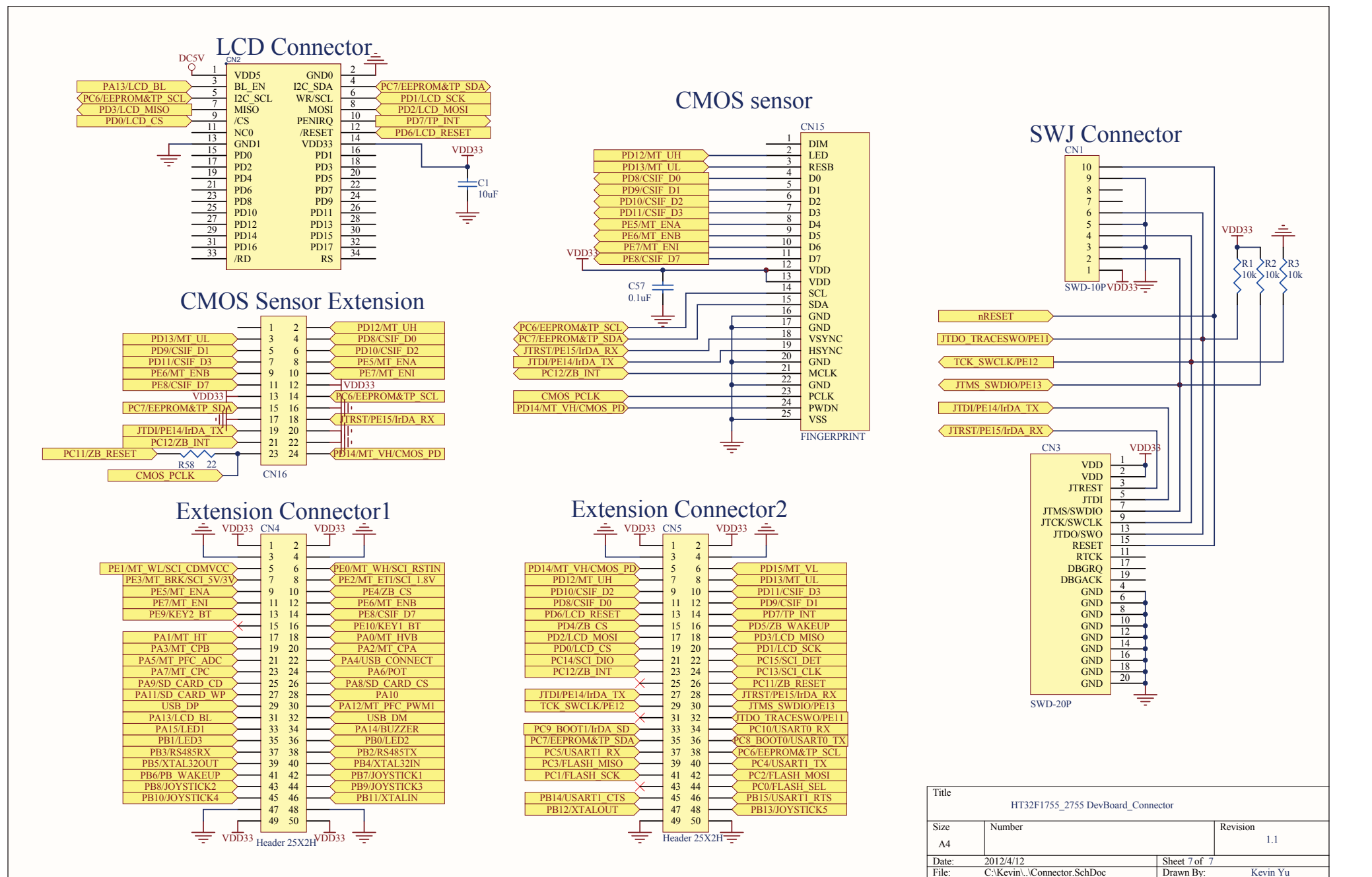


Figure 24. LCD, Extension Connectors and SWD/JTAG Connector

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File:	C:\Kevin\Connector.SchDoc	Drawn By: Kevin Yu

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